

ple, more akin to the elementary state than those which they have received. By degrees these decompose the organic matters slowly created by plants; they bring them back little by little towards the state of carbonic acid, water, azote and ammonia, a state which allows them to be returned to the air.

In burning or destroying these organic matters, animals always produce heat, which radiating from their bodies in space, goes to supply the place of that which vegetables had absorbed.

Thus all that air gives to plants, plants give up to animals, and animals restore it to the air,—an eternal circle in which life keeps in motion and manifests itself, but in which matter merely changes place.

The brute matter of air, organized by slow degrees in plants, comes, then, to perform its part without change in animals, and serves as an instrument for thought; then vanquished by this effort and broken, as it were, it returns brute matter to the great reservoir whence it came.

#### BIBLIOGRAPHICAL NOTICES.

*A List of the Genera of Birds, with their Synonyma, and an Indication of the typical Species of each Genus.* By George Robert Gray. Second Edition. Svo. London, 1841.

MR. GRAY'S 'Genera of Birds' is a systematic catalogue of all the generic groups which have been proposed by ornithologists, with their synonyms, and a reference under each genus to some one well-ascertained species by way of type. Having on a former occasion (see *Annals of Nat. Hist.*, vol. vi. p. 410, vol. vii. p. 26) published a commentary on this work when it first appeared, I am induced to offer a few further remarks on this new and improved edition. If the former work was deserving of high praise as a first attempt to introduce order and system into a chaotic mass of scattered observations, this edition may be still further commended on the ground of the great additional accuracy and completeness which it exhibits. In these days of hasty and superficial book-making, it is rare to meet with a work in which so much labour and research is condensed into so small a space, and as a tabular index of the present state of ornithology, it is one of the most complete works ever produced in any branch of zoology.

A work of such a nature is well adapted to supply statistical results. The actual number of genera enumerated in it amount to 1119. To these genera no less than 1961 Latin or systematic names have been given by different authors, so that 842 superfluous generic names have already been introduced into the science of ornithology. Yes! it is a humiliating fact, that into this most fascinating portion of Nature's Eden, no less than 842 *weeds* have been deliberately planted by the hands of those who professed to be the cultivators of

the soil ; weeds which, though they may be rooted out of the systematic arrangement, must yet, in the shape of synonyms, continue for ever to choke up the writings and load the memories of ornithologists, throwing a dusky veil of human mystification over the fair face of Nature. Does not this fact prove the necessity of naturalists agreeing upon some general rules and principles to be followed in constructing their nomenclatures? It is not, I think, asserting too much to say, that if ornithologists had had a good code of laws for their guidance, and had not in many cases yielded to personal vanity or to an indolent neglect of the labours of their predecessors, nearly the whole of these 842 useless generic names might have been spared to the science, and would have been available in other departments of zoology, from which they are now for ever excluded. Mr. Gray's work, if diffused as widely as it deserves to be, will, it may be hoped, go far in checking the daily growing evil of multiplying words without multiplying facts; and we may hope that this work will have many imitators in other branches of natural history, some of which are even in a more chaotic state than ornithology.

The principle of priority which Mr. Gray has followed in selecting his nomenclature is now daily gaining ground among judicious naturalists, but there are one or two points in which I think he has carried his principle too far, on which I now proceed to remark.

In his former edition, Mr. Gray extends the law of priority (with a few exceptions) no further back than 1760, the date of Brisson's work, but in the present edition he gives the benefit of this law to Mœhring's '*Genera Avium*,' published in 1752, and to the first edition of Linnæus' '*Systema Naturæ*,' in 1735. Now if this arrangement had *worked well* there would have been no good ground of objection to it, but it happens unfortunately that these two works have lain almost dormant from the time of their publication till 1841, when Mr. Gray has drawn them from their dusty shelves. In the mean time, many of the generic names found in these old works have been used in totally different senses by later authors, and have been now current for thirty or forty years. To these later genera Mr. Gray gives new names, and restores their former names to the old genera of Mœhring and of Linnæus's first edition, from which they have been so long removed. For instance, he follows Mœhring in giving the generic name *Spinus* to the common Bunting, *Tragopan* to a Hornbill, *Scops* to the Demoiselle Crane, *Cinclus* to the Turnstone, *Catarrhactes* to the Guillemot. So, after Linnæus's first edition, he applies the name *Grus* to the Balearic Crane, *Numenius* to the Snipes, and *Graucalus* to the Cormorants. The ornithologist will immediately remark that these names have long been applied to genera widely different from those here mentioned, genera upon which Mr. Gray is obliged to impose fresh names, either selected from later authors or new-coined for the occasion. He gives, for instance, the new name *Megalornis* to the common Crane, and *Cracticornis* to the Curlew.

These alterations of names so long established are not merely inconvenient, but it is to be feared that they will fail of their desired effect, that of producing uniformity of nomenclature. We cannot,

I think, expect that the majority of naturalists will sufficiently appreciate the claims of such rare and obscure works as Mœhring's 'Genera Avium,' and the first edition of Linnæus, as to alter a nomenclature which they have employed all their lives in favour of one which has been forgotten for a century. Here is, I think, a strong case made out for establishing a "statute of limitation." Let naturalists agree, once for all, to draw an absolute line at the date of 1760, when the elaborate standard work of Brisson appeared, and when the "binomial method" was first dawning on the mind of the great Linnæus, and let them admit no genera on the authority of any prior author, nor even of the earlier works of Linnæus himself.

Unless some such restriction be made, it is to be feared that the principle of priority, instead of producing uniformity of nomenclature, will, from the want of a fixed point of departure, lead to greater confusion than now exists.

Another respect in which I think Mr. Gray has rather over-legislated, is that of altering names on the ground, not of their *identity*, but only of their *similarity* to others previously used. He cancels, for instance, the names *Astur*, *Brachypterus*, *Tyrannula*, *Stelleria*, *Calliste*, on account of their resemblance to the names *Aster*, *Brachypteryx*, *Tyrannulus*, *Stellaria*, *Callistus*, previously employed in other branches of science. For such changes he cites the authorities of Dr. Horsfield and Mr. Swainson, but I think it is very questionable whether it would be prudent for naturalists to allow this practice to become a law. The total number of generic names which have been proposed in natural history is probably not less than 30,000, and we may be well satisfied if, amidst this vast multitude, we can guard against the repetition of *identical* terms, without being too fastidious as to those which are only *similar*. Indeed, the number of duplicate *identical* names is now becoming so considerable, that some naturalists (with whom I am far from agreeing) are beginning to plead for their preservation when they occur in distant departments of organic nature. It is then hardly to be expected that the majority of naturalists will consent to the cancelling established names on the ground of mere *resemblance* to previous ones. And the extension of science has now caused so much division of labour, that a student in one department is seldom even aware of the existence of these allied terms in other branches of natural history, much less is he likely to be led into error by them. The ancient Latins could distinguish *muscus* from *musca*, or *ovis* from *ovum*, without falling into error, and why may not the moderns?

A further argument against this practice is, that it is impossible to define what amount of resemblance between two words shall justify the cancelling one of them. When the *same* name is repeated twice over, the case does not admit of dispute; but if mere *similarity* were declared illegal, the litigation would be endless. If *Stelleria* cannot coexist with *Stellaria*, what is to become of *Otus* and *Otis*, *Lepus* and *Lepas*, *Sylvia* and *Silpha*, *Sturnus* and *Sterna*, *Colymbus* and *Columba*, *Hirundo* and *Hirudo*, &c. &c.?

It appears to me far better to retain all generic names which ex-



hibit, *when correctly spelt*, a difference from all preceding ones, though it amount only to a single letter.

At the same time, the principle proposed by Mr. Gray should operate as a *caution* to naturalists, when constructing new generic names, to avoid, as far as possible, such terms as closely resemble those already adopted.

The number of generic groups enumerated in this work amounts, as before stated, to 1119. It is to be hoped that this number will in future be increased only by the discovery of new forms. It is after all a mere matter of taste, how far the process of forming new genera by subdividing old ones shall be carried. Subdivide as we may, the diversities of structure will never be exhausted until each species is made into a genus, for there is rarely an instance of two species, however closely allied, that precisely agree in the proportions of all their parts. We may therefore cease from subdividing when we think that the limit of convenience has been attained; and most persons will admit that it has been reached, if not exceeded, in the case before us, where about 5000 species (for no more are known *with accuracy*) are distributed into no less than 1119 genera. Mr. Gray is of opinion that these genera might be advantageously condensed to the number of about 800, and in this I quite agree with him.

The systematic classification adopted by Mr. Gray is considerably improved in this edition, though there are still several groups which I think might be better arranged. Most of these cases were pointed out in my former commentary; and as the question of affinities is, in the present state of our knowledge, in great measure open to opinion, it is very natural that Mr. Gray's views should occasionally differ from mine.

The alphabetical index is a valuable appendage to the present edition, but one thing is still needed, a list of the books which have been consulted in compiling this work. Many of the authorities for genera have been extracted with great perseverance from works of extreme rarity in this country, and it would have been a great aid to the student if the titles of these works had been enumerated in Mr. Gray's book. I would suggest that this defect might be in some degree supplied if Mr. Gray would send such a list to this Magazine.

I now proceed as before to remark on the details of Mr. Gray's volume, but it will be seen, that from the far greater accuracy of the present edition, my criticisms will be much less numerous than on the former occasion.

At page ix of his preface, Mr. Gray states, through an oversight, that the number of genera of birds in Linnæus' last edition is 104, when in fact they are 78. It follows that the calculations deduced therefrom are erroneous. The proportion of species to genera in the 'Systema Naturæ' will be twelve to one, not nine to one.

Page 7 of the text. For the reasons above stated, I trust that the name *Scops* will be retained for the genus of Owls which has so long borne it, in which case the type should be called *Scops zorca* (Gm.), not *Scops aldrovandi*, Bon.

P. 8. The name *Asio*, Briss., 1760, should supersede *Otus*, Cuv., 1799, and the type will then stand as *Asio otus* (Lin.).

The genus *Glaucidium* belongs to the subfamily *Surninæ*.

P. 10. The name *climacteris*, applied to the type of *Scotornis*, is, I believe, a mistake for *climacurus*.

P. 12. *Erolla*, Less., 1831, should give way to *Peltops*, Wagl., in Oken's 'Isis,' 1829.

P. 13. In my former criticism on the use of the word *Capito* I was misled by its erroneous application in Mr. Gray's first edition to the *Bucco tamatia* of Gmelin. Mr. Gray has now cleared the difficulty by showing that *Capito* and its synonym *Nyctactes* are equivalents of *Micropogon*, Tem., and he has therefore given a new name, *Chau-nornis*, to *B. tamatia*, Gm. In a supplementary note, p. 102, Mr. Gray points out that this genus ought in strictness to bear the name of *Bucco*, Lin., as the only species of *Bucco* mentioned by Linnæus belongs to this group. There is indeed no denying that modern authors have departed from the original type of *Bucco*, Lin., in restricting that name to the East Indian Barbets; but this application of the term (though incorrect) is now so universally adopted, that I decidedly think it has acquired a prescriptive right which it would be very injudicious to set aside.

P. 18. *Heliothryx* should be written *Heliothrix*.

P. 20. It appears from Cuvier's 'Règ. Anim.' that the *Merops moluccensis*, Gm., is the type of Commerson's genus *Philedon*, and that name is long anterior to *Philemon*, Vieill.

P. 23. *Dendroma*, Sw., cannot be synonymous with *Diglossa*, Wagl., as it is described by Swainson with the margins of the beak entire. *Dendroma* appears to me to be equivalent to *Philydor*, Spix, and to include his three species *superciliaris*, *albugularis*, and *ruficollis*.

P. 24. The earliest specific name of *Xiphorhynchus procurvus* seems to be *trochilirostris*, Licht., and that of *Sittasomus sylviellus* is *erithacus*, Licht.

P. 26. *Thryothorus* should be written *Thryothorus* (from *θρῑν*, a reed, *θρῑέω*, to leap).

*Thryothorus arundinaceus*, Vieill., should be called *T. ludovicianus* (Lath.).

According to my observations, the *Edela ruficeps*, Less. (*Orthotomus edela*, Tem., P. C. 599. f. 2.), is the same as *Motacilla sepium* of Raffles, but is not the *Orthotomus sepium* of Horsfield.

P. 28. The earliest binomial specific name of *Locustella* is *rayi*, Gould. It is a misapprehension of Ray's meaning to call the bird *Locustella avicula*, Ray. He uses the word *avicula* not as being less general than *Locustella*, but more so. He intended to say, "a small bird called *Locustella*," and not "the species of *Locustella* called *avicula*," which would be his meaning if *avicula* were a specific name.

The genus *Erythropygia*, Smith, ought, I think, to be separated from *Aedon*, Boié, notwithstanding the similarity of plumage. *Erythropygia* is a South African group connecting *Cossypha*, Vig., with *Saxicola*, while *Aedon* is an European genus near *Acrocephalus*.

Mr. Gray quotes Pl. Enl. 651. f. 1. both under *Phyllopneuste hippolais* and *Phylloscopus trochilus*. The latter citation is the correct one.

The genus *Phyllopneuste*, as typified by *P. hippolais*, ought, I think, to be united with *Acrocephalus*.

The name *Lusciniola*, Gray, 1841, should not supersede *Calamodyta*, Bon., 1838. *Lusciniola* is not used generically either by Brisson or Ray; and I have before remarked, that if we cross the boundary line of modern science fixed by the introduction of the binomial method, we must carry back our nomenclature not merely to Ray or Aldrovandus, but to Pliny and Aristotle, nay to Hesiod, Homer, and Moses.

P. 29. The genus *Adornis*, Gray, 1841, ought to retain the name *Curruca*, Bechst. (restricted), used also by Meyer, Cuvier, Fleming, Bonaparte, Swainson, &c., both on the ground of priority and because it includes the bird called *Curruca* by Brisson, which is the female of *Curruca orphea* (Tem.). The *Motacilla hortensis*, Gm. (*Sylvia hortensis*, Lath.), and the figure of Buffon, Pl. Enl. 579. f. 1, also refer to *C. orphea*, fem. The true "Pettychaps" (*C. hortensis*, auct.) is the *Sylvia hortensis*, var.  $\beta$ . of Latham, which was first clearly distinguished by Bechstein.

P. 31. Mr. Gray gives no synonyms for *Iora scapularis*, Horsf., but it ought to stand as *Iora tiphia* (Lin.), Vig.; *Sylvia zeylonica*, Lath.; *Fringilla multicolor*, Gm.; *Muscicapa cambayensis*, Lath.; *Iora scapularis*, Horsf.; *Motacilla subviridis*, Tickell.

P. 33. It does not appear why *Helinaia*, Aud., 1839, is used instead of *Vermivora*, Sw., 1827.

The bird figured by Gould, 'Birds of Europe,' pl. 138, is not the *Anthus aquaticus*, Bechst., of South Europe, but is the British and North European species *A. obscurus* (Gm.), Tem.; *Alauda petrosa*, Mont.; *Anthus rupestris*, Nils. See Temminck, 'Man. Orn.,' pt. 4. p. 628.

P. 35. Why is the name *Petrocosyphus*, 1826, preferred both to *Monticola*, 1822, and *Petrocincla*, 1825?

P. 37. *Garrulax belangerii*, Less., is a synonym of *G. leucolophus* (Hardwick), not of *G. perspicillatus* (Gm.). The earliest synonym of *Malacocercus striatus* is *Turdus griseus*, Gm.

P. 39. The following genus should be inserted near *Pycnonotus*: OREIAS, Tem., 1838, < *Ixos*, Tem. Type, *O. azureus*, Tem., Pl. Col. 274.

P. 40. The following genus should be inserted near *Alectrurus*: COPURUS, Strickland, 1841, < *Platyrhynchus*, Spix, < *Muscipeta*, Cuv. Type, *C. filicauda* (Spix), Av. Braz., vol. ii. pl. 14; *Muscicapa leucocilla*, Hahn.

P. 41. The reference Buff., Pl. Enl. 276, belongs to *Pitangus sulphuratus*, and Pl. Enl. 212. to *Scaphorhynchus pitangua*.

The earliest specific name of the North American *Tyrannus*, Pl. Enl. 676, is *carolinensis*, Gm.; the next in date is *pipiri*, Vieill., Ois. Am. pl. 44. This bird is not the *Lanius tyrannus*, Lin., which is the *T. dominicensis*, Briss., Vieill., O. Am. pl. 46.



*Milvulus savana* is the *Muscicapa tyrannus*, Lin., and should bear the latter specific name.

P. 43. The *Muscicapa flabellifera* of Gm. and Lath. is not the *Rhipidura flabellifera* of Vigors and Horsfield, which last is the *R. albiscapa* of Gould.

P. 44. The earliest synonym of *Liothrix furcata* is *Tanagra sinensis*, Gm.

P. 46. Mr. Gray is fully justified in removing the name *Ampelis* from the American genus which has borne it of late years, and restoring it to the Waxen Chatterer of Europe. The latter bird is clearly the type of the genus *Ampelis* of Linnæus, who took this name from the old authors, and Vieillot ought therefore to have retained this title to the Waxen Chatterer, instead of the new one *Bombycilla*. We may the better reconcile ourselves to this change as it happens fortunately that the American Chatterers are already provided with a name by Brisson, who in 1760 defined for them the genus *Cotinga*.

I have seen reason to reverse the opinion I formerly expressed respecting the genera *Tersa*, Vieill., and *Chasmorhynchus*, Tem., each of which claims to be the lineal descendant of the old genus *Procnias*, Ill., and consequently to bear its name. The question is, what type did Illiger adopt for his genus? Now he cites three species of *Procnias*, as follows:—" *Ampelis variegata*, *carunculata*? Lin., Gmel., *Hirundo viridis*, Tem. Catalog." The first two belong to *Chasmorhynchus*, and the last to *Tersa*; therefore, if we assume the first on the list to be the type of Illiger's genus, the title of *Procnias* will devolve upon *Chasmorhynchus*. But in determining an author's type, other points must be considered besides the order in which he enumerates his species. If we suppose with Temminck, that Illiger's mark of interrogation refers to both the first and second species on his list, we must assume the third to be the one about which he had no doubt, and from which the characters of his genus were taken. That such was the case, will be evident from the characters which he has assigned to the genus *Procnias*, among which we find " *Rostrium brevius*; *nares basales*, *membranâ plumis frontibus aut setis obsitâ*, *clausæ*; *alæ mediocres*." Now all these characters strictly apply to *Tersa*, Vieill., but do not suit *Chasmorhynchus*, Tem. Moreover, the name *Procnias* clearly alludes to the swallow-like form of *Tersa* (which induced Temminck at that time to call it *Hirundo viridis*), which cannot be asserted of *Chasmorhynchus*. I think, therefore, that we ought to follow Temminck in retaining the name *Chasmorhynchus* for the one genus, and conferring the name *Procnias*, Ill. (restr.), on the *Tersa* of Vieillot.

The type of *Cotinga* does not require a new specific name. The blue-banded species or variety, Pl. Enl. 188, was called *A. cincta* by Kuhl in 1820, and the plain-breasted one, Pl. Enl. 186, is the *A. cærulea* of Vieillot, 1824.

P. 47. The *Chibia barbata*, Gray, is the *Corvus hottentottus*, Lin., and the *Criniger splendens* of Tickell, 1833.

P. 48. For *Telophorus* read *Telophonus* (from *τῆλε* and *φωνή*).

P. 53. Insert the genus *ENODES*, Tem., 1838. < *Lamprotornis*, Tem. Type, *E. erythrophrys*, Tem., Pl. Col. 267.

P. 56. Erase *Oriolus caudacutus*, Gm., from the synonyms of *Dolichonyx*, as it is also cited under *Ammodromus caudacutus*, p. 61.

P. 57. Add *Chlorion*, Tem., 1838, to the synonyms of *Emberizoides*.

P. 59. *Citrinella serinus*, Bon., should be called *C. brumalis* (Gm.), and *Petronia rupestris*, Bon., should stand as *P. stulta* (Gm.).

P. 61. The true *Fringillaria capensis* (Lin.) is figured in Pl. Enl. 158. f. 2, and is distinct from *F. flaviventris* (Vieill.) (*F. flavigaster*, Rupp.). Pl. Enl. 664. f. 2.

P. 62. The specific name of *Agrodroma* should be *campestris* (Bechst.), not *rufescens*. Temminck makes it an *Anthus*, not an *Alauda*, and it unquestionably should be placed next to, if not in, the genus *Anthus*, and not among the *Alaudinæ*; into which group it was forced by Mr. Swainson, in order to fill a gap in the quinary system.

P. 63. *Crithagra* should stand in the *Fringillinæ* next *Serinus*.

P. 69. Mr. Gray's new name *Laimodon* should be written *Læmodon*, α in Greek becoming æ in Latin. (See Linnæus, Phil. Bot., § 247.)

Is Mr. Gray correct in quoting *Bucco barbatula*, Tem., under his *Barbatula nana*? Levaillant's pl. 56. (the basis of *B. barbatula*, Tem.) seems very different from the description of *Bucco parvus*, Gm. (the basis of *Barbatula nana*).

*Calorhamphus fuliginosus* (Tem.), mihi, is certainly not the *Bucco lathamii*, Gm. See Lath. Syn. pl. 22.

P. 70. Is not the genus *Sasia*, Hodgs., identical with *Microcolaptes*?

P. 73. *Pseudornis*, Hodgs., is more allied to *Cuculus* than to *Oxylophus*, but seems to be sufficiently distinct from both to deserve a generic rank.

P. 77. Latham describes his *Phasianus leucomelanus* with a black crest. It must therefore be the *Lophophorus cuvieri*, Tem., and not the *Euplocamus hamiltoni*, as stated at p. 102.

P. 80. I do not find a "*Perdix olivacea*" in Latham's 'Index Ornithologicus'; therefore, if the name *olivacea* originated with Hodgson, it should give way to the prior name *megapodia*, Tem.

P. 88. Independently of the objections which exist to our reviving the obsolete nomenclature of Linnæus' first edition, there can, I think, be no doubt that the Curlew, and not the Snipe, should be regarded as the type of his genus *Numenius*. The latter name was given to the Curlew in allusion to the crescent-shaped form of the beak, (from νέος, new, and μήνη, moon,) a character which does not apply to the Snipes.

Those who retain the Whimbrel as a distinct genus should call it *Phæopus vulgaris*, Flem., but there is certainly no good ground for separating it generically from the Curlews (*Numenius*, Lath.).

The *Scolopax pygmaeus*, Gm., is said by Temminck to be the same as *Pelidna platyrhyncha*, and as nothing is said of its having



three toes, it cannot be referred with certainty to *Erolia*. The latter bird should therefore be called *Erolia variegata*, Vieill., 1816 (not *E. varia*, Vieill., 1824).

*P. 89. Pelidna subarquata* ought not to be distinguished as a genus from *Pelidna cinclus*. Both have the beak curved, though not quite in the same degree.

*P. 90. Microptera*, Nuttall, is synonymous with *Philohela*, Gray.

*P. 95. Camptolaimus* should be written *Camptolæmus*.

*P. 99.* If the claims of Mœhring to a share in our modern nomenclature be disallowed, then the name *Gavia*, Boié, 1822, may be restored to the *G. eburnea* (Gm.).

H. E. STRICKLAND.

### *Works lately Published.*

Bartlett's Index Geologicus, or Geology at One View; published under the auspices of the Geological Section of the Devon and Cornwall Natural History Society; a Diagram, 3 ft. 6 in. by 2 ft. 9 in., in Case, or mounted on Rollers and varnished, with a coloured Section of Strata, on copper; showing the relative position of all the different stratified and unstratified Rocks, with the classification and arrangement, *in situ*, of Animal and Vegetable Fossil Remains, with the mineral accompaniments of each stratum.

Mr. Clifford of Tunbridge Wells has just republished 'Flora Tunbrigensis,' with an additional list of new plants, and a life of the author, the late T. F. Forster, Esq., F.L.S., communicated by his son, Dr. T. Forster, F.L.S., &c.

Dr. Forster has also just published 'Observations on the Abnormal Affections of the Organs of Sense and Intellect,' &c. 8vo.

Vegetable Organography; or, an Analytical Description of the Organs of Plants; by Professor DeCandolle. Translated (unabridged) by Boughton Kingdon, Esq.

A History of British Forest Trees, indigenous or introduced; by P. J. Selby, Esq., of Twizell.

A Treatise on the Management of Freshwater Fish, with a view to making them a source of profit to Landed Proprietors; by Gottlieb Bocchius.

A new edition of Lambert's Genus *Pinus*, including all the new species of this important family of Trees, with direction for their cultivation, &c. Royal 8vo.

British Moths and their Transformations; in a Series of Plates by H. N. Humphreys, Esq., with Descriptions by J. O. Westwood, Esq., F.L.S.

Transactions of the Manchester Geological Society. Vol. I.

### *Preparing for Publication.*

THE GEOLOGY AND MINERALOGY OF ENGINEERING; comprehending the elements of the sciences of Economic Geology and Mineralogy applied to the Arts. By E. W. Brayley, Jun., Fellow of the Linnæan and Geological Societies, Associate of the Institution of Civil Engineers, Corresponding Member of the Royal Geological Society of Cornwall, &c.